

Curriculum Vitae

DANIEL M. ENNIS

The Institute for Perception • 7629 Hull Street Road • Richmond, Virginia 23235
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EDUCATION

B. Agr. Sc. (1972) University College Dublin, Ireland

Ph.D. (1975) and M.S. (1974) Food Science and Biometrics, University of Maryland

Research Area: Environmental Microbiology

D.Sc. (1991) Mathematical and Statistical Psychology, Wageningen University, The Netherlands

Research Area: Probabilistic Models of Perception

AFFILIATED PROFESSORSHIPS

Department of Foods and Nutrition, University of Illinois, Champaign, Illinois

Department of Physiology, Medical College of Virginia, Richmond, Virginia

2013 AWARDS

The Institute of Food Technologists Achievement Award in Sensory and Consumer Science

The ASTM David R. Peryam Award for excellence in Sensory Science

EMPLOYMENT

The Institute for Perception - Richmond, Virginia (1994 – Present)

Founder and President. Develops advanced research tools for human perceptual measurement and applies them to industrial problems. Client services include project management and the application of quantitative methods in product development, quality assurance and market research. Actively involved in contributing papers to peer-reviewed journals, teaching short courses and seminars to industrial participants, and developing proprietary software.

Philip Morris USA - Richmond Virginia (1979 – 1994)

Managed several groups including those involved in statistical services and consumer product/concept testing. Developed new methods and published research in psychometrics. Awarded the Philip Morris Distinguished Scientist Award (presented at the TCRC) in 1991 for mathematical models of human perception. Patented an algorithm for high speed machine vision inspection in manufacturing. Other contributions included: Pricing research and guidance to management in support of a major price reduction initiative; consulting on innovation management; and coordination of an international program of academic research on smoking behavior.

Frito-Lay, Dallas, Texas (1978-1979)

Product development scientist.

University of Guelph, Ontario, Canada (1976-1978)

Assistant Professor. Courses in Statistical Quality Control and Beverage Technology.

CATEGORY EXPERIENCE

Product testing: Alcoholic beverages, tobacco, food and beverage products, fine fragrances, air care, home and furniture care, insect repellents, personal care, laundry products, and hearing aids.

Legal (including advertising claim and trademark disputes): Floor care products, pet foods, motion sickness products, tooth whitening, bank names, cell phones, sweeteners, insect repellants, diaper pails, cat litter products, pregnancy tests. Provide pro-bono consulting for the NAD (National Advertising Division of the Council of Better Business Bureaus.) Teach a course annually on product testing for claims support. Consulted on statistical analysis of art valuation in an international art fraud case.

PROFESSIONAL MEMBERSHIPS

Society for Mathematical Psychology, Institute of Food Technologists, Association for Chemoreception Sciences, American Society for Testing and Materials (ASTM), American Statistical Association, The Psychometric Society.

REVIEWER FOR JOURNAL SUBMISSIONS

Journal of Mathematical Psychology, Psychometrika, Sensory Studies, J. Food Science, Food Quality and Preference, Perception and Psychophysics, Psychological Science, J. Experimental Psychology, Food Technology.

REFEREED PUBLICATIONS

Psychometrics and Mathematical and Statistical Psychology

- Ennis, D. M. & Ennis, J. M. (2013 *in press*). Analysis and Thurstonian scaling of applicability scores. *Journal of Sensory Studies*.
- Ennis, D. M. & Ennis, J. M. (2013). A Thurstonian ranking model with rank-induced dependencies. *Journal of Classification*, 30, 124-147
- Ennis, J. M., Fayle, C. M., & Ennis, D. M. (2012). Assignment-minimum clique coverings. *Journal of Experimental Algorithmics (JEA)*, 17(1), 1.5:1-1.5:17.
- Ennis, J. M., & Ennis, D. M. (2012). A comparison of three commonly used methods for treating no preference votes. *Journal of Sensory Studies*, 27(2), 123-129.
- Ennis, D. M. & Ennis, J. M. (2012). Accounting for no difference/preference responses or ties in choice experiments. *Food Quality and Preference*, 23(1), 13-17.
- Ennis, D.M. (2006). Sources and influence of perceptual variance: Comment on Dzhamfarov's regular minimality principle. *Journal of Mathematical Psychology*, 50, 66-73.
- Ashby, F. G., and Ennis, D. M. (2002). A Thurstone-Coombs model of concurrent ratings with sensory and liking dimensions. *Journal of Sensory Studies*, 17, 43-59.
- Rousseau, B., and Ennis, D.M. (2002). The multiple dual pair method. *Perception & Psychophysics*, 64, 1008-1014.
- Rousseau, B., and Ennis, D. M. (2001). A Thurstonian model for the dual pair (4IAX) discrimination method. *Perception & Psychophysics*, 63, 1083-1090.
- Bi, J., and Ennis, D. M. (2001). Statistical models for the A-Not A method. *Journal of Sensory Studies*, 16, 215-237.
- Bi, J., and Ennis, D. M. (2001). The power of the A-Not A method. *Journal of Sensory Studies*, 16, 343-359.
- Ennis, J. M., Ennis, D. M., Yip, D., and O'Mahony, M. (1998). Thurstonian models for variants of the method of tetrads. *British Journal of Mathematical and Statistical Psychology*, 51, 205-215.
- Ennis, D. M., and O'Mahony, M. (1995). Probabilistic models for sequential taste effects in triadic choice. *Journal of Experimental Psychology: Human Perception and Performance*, 21(5), 1-10.
- Ennis, D. M., and Johnson, N. L. (1994). A general model for preferential and triadic choice in terms of central F distribution functions. *Psychometrika*, 59(1), 91-96.
- Geelhoed, E.N., MacRae, A.W., and Ennis, D. M. (1994). Preference gives more consistent judgments than oddity only if the task can be modeled as forced choice. *Perception & Psychophysics*, 55(4), 473-477.
- Ennis, D. M. (1993). A single multidimensional model for discrimination, identification, and preferential choice. *Acta Psychologica*, 84, 17-27.
- Ennis, D. M. (1993). The power of sensory discrimination methods. *Journal of Sensory Studies*, 8, 353-370.

- Ennis, D.M., and Ashby, F.G. (1993). The relative sensitivities of same-different and identification judgment models to perceptual dependence. *Psychometrika*, **58**(2), 257-279.
- Ennis, D. M., and Johnson, N. L. (1993). Thurstone-Shepard similarity models as special cases of moment generating functions. *Journal of Mathematical Psychology*, **37**(1), 104-110.
- Ennis, D. M., and Mullen, K., (1992). A general probabilistic model for triad discrimination, preferential choice, and two-alternative identification. In F. Gregory Ashby (Ed.), *Multidimensional Models of Perception and Cognition*, Mahwah, NJ: Lawrence Erlbaum Associates.
- Ennis, D. M., and Mullen, K. (1992). Probabilistic psychophysics with noisy stimuli. *Mathematical Social Sciences*, **23**, 221-234.
- Ennis, D. M. (1992). Modeling similarity and identification when there are momentary fluctuations in psychological magnitudes. In F. Gregory Ashby (Ed.), *Multidimensional Models of Perception and Cognition*, Mahwah, NJ: Lawrence Erlbaum Associates.
- Mullen, K., and Ennis, D. M. (1991). A simple multivariate probabilistic model for preferential and triadic choices. *Psychometrika*, **56**(1), 69-75.
- Ennis, D. M. (1990). The relative power of difference testing methods in sensory evaluation. *Food Technology*, **44**, 114, 116 & 117.
- Ennis, D. M., Mullen, K., Fritjers, J. E. R. and Tindall, J. (1989). Decision conflicts: Within-trial resampling in Richardson's method of triads. *British Journal of Mathematical and Statistical Psychology Society*, **42**, 265-269.
- Ennis, D. M., Palen, J., and Mullen, K. (1988). A multidimensional stochastic theory of similarity. *Journal of Mathematical Psychology*, **32**(4), 449-465.
- Ennis, D. M. (1988). Confusable and discriminable stimuli: Comments on Nosofsky (1986) and Shepard (1986). *Journal of Experimental Psychology: General*, **117**(4), 408-411.
- Mullen, K., Ennis, D. M., de Doncker, E., and Kapenga, J. A. (1988). Models for the duo-trio and triangular methods. *Biometrics*, **44**, 1169-1175.
- Ennis, D.M. (1988). Toward a universal law of generalization. (Technical comment on Shepard, Science, 237: 1317). *Science*, **242**, 944.
- Ennis, D. M., Mullen, K. and Fritjers, J. E. R. (1988). Variants of the method of triads: Unidimensional Thurstonian models. *British Journal of Mathematical and Statistical Psychology*, **41**, 25-36.
- Ennis D.M., and Mullen, K. (1987). A psychophysical-decision model for sensory difference detection methods. *New York Academy of Sciences*, **510**, 265-267.
- Mullen, K., and Ennis, D. M. (1987). Mathematical formulation of multivariate Euclidean models for discrimination methods. *Psychometrika*, **52**(2), 235-249.
- Kapenga, J.A., Mullen, K., de Doncker, E., and Ennis, D. M. (1987). The integration of the multivariate normal density function for the triangular method. In P. Keast and G. Fairweather (Eds.), *Numerical Integration*, Boston, MA: Reidel Publishing Company, 321-328.
- Ennis, D. M., and Mullen, K. (1986). A multivariate model for discrimination methods. *Journal of Mathematical Psychology*, **30**(2), 206-219.
- Ennis, D.M., & Mullen, K. (1986). Theoretical aspects of sensory discrimination. *Chemical Senses*, **11**, 513-522.
- Ennis, D. M., and Mullen, K. (1985). The effects of dimensionality on results from the triangular method. *Chemical Senses*, **10**(4), 605-608.

Statistics

- Ennis, J. M., Fayle, C. M., & Ennis, D. M. (2012). eTURF: A competitive TURF algorithm for large datasets. *Food Quality and Preference*, 23(1), 44-48.
- Ennis, J. M. & Ennis, D. M. (2012). Justifying count-based comparisons. *Journal of Sensory Studies*, 27(2), 130-136.
- Ennis, J.M. and Ennis, D.M. (2011). Confidence bounds for multiplicative comparisons. *Communications in Statistics - Theory and Methods*, 40, 3049-3054.
- Ennis, D.M. and Ennis, J.M. (2010). Equivalence hypothesis testing. *Food Quality and Preference*, 21, 253-256.
- Ennis, D. M. & Ennis, J. M. (2010). Equivalence hypothesis testing: Reply to Bi. *Food Quality and Preference*, 21, 261.
- Ennis, D.M. and Ennis, J.M. (2009). Hypothesis testing for equivalence based on symmetric open intervals. *Communications in Statistics*, 38(11), 1792-1803.
- Ennis, D., Ennis, J., Palen, J., Lampe, R. (2008). Confidence Bounds for Positive Ratios of Normal Random Variables. *Communications in Statistics - Theory and Methods*, 37, 307-317.
- Ennis, D. (2008). Rejoinder to Bi and Meyners. *Food Quality and Preference*, 19, 347-348.
- Ennis, D. (2008). Response to Bi, J. (2007). Similarity testing using paired comparison method. *Food Quality and Preference* 18, 500-507. *Food Quality and Preference*, 19, 344.
- Ennis, D. (2008). Tables for Parity Testing. *Journal of Sensory Studies*, 23, 80-91.
- Bi, J., and Ennis, D.M. (2001). Exact beta-binomial tables for small experiments. *Journal of Sensory Studies*, 16(3), 319-325.
- Bi, J., Templeton-Janick, L., Ennis, J., and Ennis, D.M. (2000). Replicated difference and preference tests: How to account for inter-trial variation. *Food Quality and Preference*, 11(4), 269-273.
- Bi, J., and Ennis, D. M. (1999). Beta-binomial tables for replicated difference and preference tests. *Journal of Sensory Studies*, 14, 347-368.
- Ennis, D. M., and Bi, J. (1999). The Dirichlet-Multinomial Model: Accounting for inter-trial variations in replicated ratings. *Journal of Sensory Studies*, 14, 321-345.
- Bi, J., and Ennis, D. M. (1999). The power of sensory discrimination methods used in replicated difference and preference tests. *Journal of Sensory Studies*, 14, 289-302.
- Bi, J., and Ennis, D.M., (1998). A Thurstonian variant of the beta-binomial model for replicated difference tests. *Journal of Sensory Studies*, 13, 461-466.
- Ennis, D.M., and Bi, J. (1998). The beta-binomial model: Accounting for inter-trial variation in replicated difference and preference tests. *Journal of Sensory Studies*, 13, 389-412.
- Ennis, D. M., and Johnson, N. L. (1993). Noncentral and central chi-square, *F* and beta distribution functions as special cases of the distribution function of the indefinite quadratic form. *Communication in Statistics - Theory and Methods*, 22(3), 897-905.
- Mullen, K., and Ennis, D. M. (1985). Fractional factorials in product development. *Food Technology*, 39(5), 90,92,94,97-98, 100, & 102-103.
- Mullen, K., and Ennis, D. M. (1979). Rotatable designs in product development. *Food Technology*, 33(7), pp. 74, 75, 78, 79, and 80.

Chemistry, Chemical Senses, and Pharmacokinetics

- Ennis, D.M. (2000). Molecular mixture models: Connecting molecular events to perception. P. Given and D. Paredes, (Eds.), *In Chemistry of Taste: Mechanisms, Behavior, and Mimics*, San Francisco, CA: American Chemical Society.
- Ennis, D. M. (1996). A general molecular model for the effect of multi-component mixtures on biological systems. *Food Chemistry*, 56(3), 329-335.

Rosett, T. R., Wu, Z., Schmidt, S. J., Ennis, D. M., and Klein, B.P. (1995). KCl, CaCl₂, Na⁺ Binding, and Salt Taste of Gum Systems, *Journal of Food Science*, **60**(4), 849-853, 867.

Ennis, D. M. (1992). Kinetic models of sweet taste. *Trends in Food Science & Technology*, **3**, 169-173.

Ennis, D. M. (1991). Molecular mixture models based on competitive and non-competitive agonism. *Chemical Senses*, **16**(1), 1-17.

Ennis, D. M. (1989). A receptor model for binary mixtures applied to the sweetness of fructose and glucose: De Graaf and Frijters revisited, *Chemical Senses*, **14**(4), 597-604.

Seeman, J. I., Ennis, D. M., Vecor, H. V., Clawson, L., and Palen, J. (1989). The perceptual similarity of substituted benzenes and pyridines as a function of steric hindrance, *Chemical Senses*, **14**(3), 395-405.

Parrish, M.E., Reilley, C.R., Good, B. W., Hsu, F.S., Hatch, F. W., Ennis, D.M., Douglas, D.R., Shelton, J.H., and Watson, D.C. (1981). Computer-enhanced high-resolution gas chromatography for the discriminative analysis of tobacco smoke. *Analytical Chemistry*, **53**, 826-831.

Marketing, Sensory Evaluation, Food Quality, Management

Ennis, D.M. (2012). Invention and Innovation. Chapter in *Tool Box for Innovating Products: A Field Guide to Consumer Understanding and Research*, Wiley-Blackwell.

Nestrud, M. A., Ennis, J. M., Fayle, C. M., Ennis, D. M., & Lawless, H. T. (2011). Validating a graph theoretic screening approach to food item combinations. *Journal of Sensory Studies*, **26**(5), 331-338.

Ennis, D.M. and Ennis, J.M. (2011). Accounting for difference/preference responses or ties in choice experiments. *Food Quality and Preference*, in press.

Ennis, D.M., and Rousseau, B. (2004). Motivations for product consumption: Application of a probabilistic model to adolescent smoking. *Journal of Sensory Studies*, **19**(2), 107-117.

Ennis, D.M. (2003). Foundations of sensory science. In H.R. Moskowitz, A.M. Munoz and M.C. Gacula (Eds.), *Viewpoints and Controversies in Sensory Science and Consumer Product Testing*. Trumbull, CT: Food & Nutrition Press.

Ennis, D. M., and Bi, J. (2000). Multivariate quality control with applications to sensory data. *Journal of Food Quality*, **23**, 541-552.

Ennis, D. M. (1998). Foundations of sensory science and a vision for the future. *Food Technology*, **52**(7), 78-84, 89.

Kim, K., Ennis, D. M., and O'Mahony, M. (1998). A new approach to category scales of intensity II: Use of d' values. *Journal of Sensory Studies*, **13**, 251-267.

Bi, J., and Ennis, D. M. (1998). Sensory thresholds: Concepts and methods. *Journal of Sensory Studies*, **13**, 133-148.

Bi, J., Ennis, D. M., O'Mahony, M. (1997). How to estimate and use the variance of d' from difference tests. *Journal of Sensory Studies*, **12**, 87-104.

Tedja, S., Nonaka, R., Ennis, D. M., and O'Mahony, M. (1994). Triadic discrimination testing: Refinement of Thurstonian and sequential sensitivity analysis approaches. *Chemical Senses*, **19**(4), 279-301.

Ennis, D. M. (1988). Multivariate sensory analysis. *Food Technology*, **42**, 118, 120-122.

Beane, T. P., and Ennis, D.M. (1987). Market segmentation: A review. *European Journal of Marketing*, **21**(5), 20-42.

Mendell, S., and Ennis, D.M. (1985) Looking at innovation strategies. *Research Management*, **28** (3), 33-40.

Anthony, K., Ennis, D. M., and Cook, P. (1984). Lemon juice color evaluation: Sensory and instrumental Studies. *Journal of Food Science*, **49**(6), 1435-1437.

Ennis, D. M., Boelens, H., Haring, H., and Bowman, P. (1982). Multivariate analysis in sensory evaluation, *Food Technology*, **36**(11), 83-90.

Ennis, D.M., Keeping, L., Chin-Ting, J., and Ross, N. (1979). Consumer evaluation of the interrelationships between the sensory components of orange juices and drinks. *Journal of Food Science*, **44**(4), 1011-1012, 1016.

Ennis, D.M., and O'Sullivan, J. (1979). Cucumber quality - a review. *Journal of Food Science*, **44**(1), 186-189, 197.

Ennis, D.M., and O'Sullivan, J. (1979). Sensory quality of cucumbers before and after brining. *Journal of Food Science*, **44**, 847-849

Environmental Science

Ennis, D.M., Kramer, A., Jameson, C.W., Mazzocchi, P.H., and Bailey, W.J. (1978). Structural factors influencing the biodegradation of imides. *Applied and Environmental Microbiology*, **35**(1), 51-53.

Ennis, D.M., Kramer, A., Mazzocchi, P.H., Jameson, C.W., and Bailey, W. (1975). Synthetic n-releasing biodegradable soil conditioners. *HortScience*, **10**(5), 505-506.

Ennis, D.M., and Kramer, A. (1975). A rapid microtechnique for testing the biodegradability of nylons and related polyamides. *Journal of Food Science*, **40**, 181-185.

Ennis, D.M., and Kramer, A. (1974). Bacteria capable of degrading polymeric and low molecular weight amides. *Proc. IV Int. Congress Food Sci. and Technol.*, **Vol III**, 423-426.

BOOKS

Ennis, D.M., Rousseau, B. and Ennis, J.M. (2011). *Short Stories in Sensory and Consumer Science*, Richmond, VA: The Institute for Perception.

Ennis, D.M., and Mullen, K. (1980). *The operating characteristics curve manual*, Boston, MA: G.K. Hall.

Puri, S., Mullen, K., and Ennis, D.M. (1979). *Statistical quality control for food and agricultural scientists*, Boston, MA: G.K. Hall.

PATENTS

Ennis, D.M. (1993). Image inspection method and apparatus. *U.S. Patent* 5,208,870.

Ennis, D.M. (1978). Synthetic N-releasing soil conditioner. *U.S. Patent*, 4,066,431.

Ennis, D.M. (1981). Process for improving soil structure. *Canadian Patent*, 1,099,942.

MEETINGS AT WHICH PAPERS WERE PRESENTED

International Congress of Food Science and Technology (Madrid, Spain, 1974), Institute of Food Technologists Annual Meeting (numerous; selected as the Scientific Lecturer for the Sensory Evaluation Division, 1998), Society for Mathematical Psychology (numerous), Psychometrics Society (1989), Chemical Senses (numerous), AMA Advanced Research Techniques Forum (Monterey, CA, 2000 and Santa Fe, NM, 2007), Sensory Science Symposium - Pangborn Conference (Davis, CA, 1995; Boston, MA, 2003, Minneapolis, 2007), American Society for Testing and Materials (numerous), Sensometrics (Edinburgh, Scotland, 1994; Davis, CA, 2004, St. Catharines, Ontario, 2008), American Chemical Society (San Francisco, CA, 1989), Joint Statistical Meetings (Washington DC, 2009), NAD Conference (New York, 2011).

TECHNICAL REPORTS PUBLISHED IN THE INSTITUTE FOR PERCEPTION'S NEWSLETTER, IFPress® (Available at www.ifpress.com)

Rousseau, B. and Ennis, D.M. (2011). Illuminating Product by Demographic Interactions. **14**(3), 2-3

Ennis, J.M., Fayle, C.M. and Ennis, D.M. (2011). From Many to Few: A Graph Theoretic Screening Tool for Product Developers. **14**(2), 2-3

Ennis, D.M. and Ennis, J.M. (2011). How to Set Identity Norms for No Preference Data. **14**(1), 2-3.

- Ennis, D.M. and Ennis, J.M. (2010). How to Account for “No Difference / Preference” Counts. **13**(3), 2-3.
- Ennis, J.M., Fayle, C.M. and Ennis, D.M. (2011). Optimum Product Selection for a Drivers of Liking Project. **13**(1),2-3
- Ennis, D.M. (2009) Scaling First-Last, MaxDiff and Best-Worst Data. **12**(3), 2-3.
- Ennis, J.M. and Ennis, D.M. (2009). Multiplicative versus Ratio Comparisons. **12**(2), 2-3
- Casale, M.B. and Ennis, D.M. (2009). Brand Effects on the Landscape of Consumer Experience. **12**(1), 2-3.
- Ennis, D.M. and Ennis, J.M. (2008). New Developments in Equivalence Testing. **11**(4), 2-3.
- Rousseau, B. and Ennis, D.M. (2008). An Application of Landscape Segmentation Analysis to Blind and Branded Data. **11**(3), 2-3.
- Ennis, J.M. and Ennis, D.M. (2008). Conditional Ratio Statements. **11**(2), 2-3.
- Rousseau, B. and Ennis, D.M. (2008). Improving the Cost and Speed of Product Innovation. **11**(1), 2-3.
- Casale, M.B. and Ennis, D.M. (2007). Category Learning and Feedback in Panel Training. **10**(4), 2-3.
- Rousseau, B. and Ennis, D.M. (2007). Why Proportion of Discriminators is Method-Specific. **10**(3), 2-3.
- Ennis, D.M. (2007). Do consumers have multiple ideals depending on usage occasions? **10**(2), 2-3
- Lampe, R. and Ennis, D.M. (2007). Discovering Time-Dependent Trends. **10**(1), 2-3
- Ennis, D.M. (2006). Parity Claims. **9**(4), 2-3
- Ennis, D.M. (2006). Making ratio statements about product improvements. **9**(2), 2-3
- Anderson, L. and Ennis, D.M. (2006). Identifying emerging opportunities in consumer markets. **9**(1), 2-3.
- Ennis, D.M. (2005). Relative scales and difference testing norms. **8**(3), 2-3.
- Ennis, D.M. (2005). Analytic approaches to accounting for individual ideal points **8**(2), 2-3.
- Ennis, D.M. (2005). Measuring product performance/image tradeoffs. **8**(1), 2-3.
- Ennis, D.M. (2004). From ranks to intensities. **7**(4), 2-3.
- Rousseau, B. and Ennis, D.M. (2004). Product concept fit. **7**(3), 2-3.
- Ennis, D.M. (2004). Competitive strategies in product portfolio design. **7**(1), 2-3.
- Ennis, D.M. (2003). Just-about-right scales. **6**(3), 2-3.
- Ennis, D.M. (2003). Designing new product portfolios. **6**(2), 2-3.
- Ennis, D.M., and Anderson, J.L. (2003). Identifying latent segments. **6**(1), 2-3.
- Ennis, D.M., and Rousseau, B. (2002). Motivations for product consumption. **5**(3), 2-3.
- Rousseau, B., and Ennis, D.M. (2002). Multivariate difference testing with multiple samples. **5**(2), 2-3.
- Rousseau, B., and Ennis, D.M. (2002). Discrimination testing with multiple samples. **5**(1), 2-3.
- Ennis, D.M. (2001). Probabilistic multidimensional scaling. **4**(3), 2-3.
- Rousseau, B., and Ennis, D.M. (2001). How retasting can improve the power of product testing. **4**(2), 2-3.
- Ennis, D.M. (2001). Drivers of Liking[®] for multiple segments. **4**(1), 2-3.
- Ennis, D.M. (2000). Population thresholds. **3**(2), 2-3.

Ennis, D.M., and Bi, J. (2000). Multivariate sensory quality control. **3**(1), 2-3.

Bi, J., and Ennis, D.M. (1999). Models for the A-Not-A method. **2**(4), 2-3.

Ennis, D.M. (1999). Thurstonian models for intensity ratings. **2**(3), 2-3.

Ennis, D.M. (1999). Multivariate preference mapping. **2**(2), 2-3.

Ennis, D.M. (1999). Molecular mixture models: Accounting for synergy in sweet tastes mixtures. **2**(1), 2-3.

Bi, J., and Ennis, D.M. (1998). Models for replicated ratings. **1**(4), 2-3.

Ennis, D.M. (1998). Thurstonian scaling for difference tests. **1**(3), 2-3.

Bi, J., and Ennis, D.M. (1998). Replicated difference and preference testing with applications to claims support. **1**(2), 2-3.

Ennis, D.M., and Bi, J. (1998). Drivers of Liking[®]. **1**(1), 2-3.

SHORT COURSES PRESENTED

1992

Basic Principles of Sensory Measurement

Chicago, Illinois; Princeton, New Jersey

1993

Basic Principles of Sensory Difference Testing

Princeton, New Jersey; Stanford, California; Chicago, Illinois; Longboat Key, Florida

1994

Foundations of Product Testing Methodology

Sea Island, Georgia; Williamsburg, Virginia (June & Nov); Louisville, Kentucky

1995

Foundations of Product Testing Methodology

Sea Island, Georgia

Foundations of Product & Concept Measurement

Tools to Measure and Relate Sensory Panel and Consumer Data

Hilton Head, South Carolina

1996

Foundations of Product & Concept Measurement

Tools to Measure and Relate Sensory Panel and Consumer Data

Hilton Head, South Carolina; Sea Island, Georgia

1997

Foundations and Tools of Product and Concept Measurement

Current Topics in Sensory and Consumer Science

Product Optimization

Sea Island, Georgia

1998

Foundations and Tools of Product and Concept Measurement

Drivers of Liking® and How to Optimize Products

Sea Island, Georgia

Foundations and Tools of Product and Concept Measurement

Drivers of Liking and Preference

White Sulphur Springs, West Virginia

1999

Foundations and Tools of Product and Concept Measurement

Drivers of Liking® and Preference

White Sulphur Springs, West Virginia

1999-2006 (Annually)

Current Topics in Sensory and Consumer Science (1999-2004)

Tools and Applications of Sensory and Consumer Product Testing (2005-2006)

Multivariate Mapping and Drivers of Liking® (2005-2006)

Paris, France (2003 only)

Sea Island, Georgia

White Sulphur Springs, West Virginia

2007-2009

Tools and Applications of Sensory and Consumer Product Testing

Seeing the Market through the Eyes of the Consumer

Sea Island, Georgia (2007)

Williamsburg, Virginia (2008, 2009)

White Sulphur Springs, West Virginia (2007-2009)

Munich, Germany (2008)

Madison, Wisconsin (2008)

Chicago, Illinois (2008 and 2009)

Tarrytown, New York (2009)

New Orleans, Louisiana (2008) [Invited Pre-IFT short course]

Application of the Concept of Ideal Points

New Orleans, Louisiana (2008) [Invited Pre-IFT short course]

Descriptive Analysis and Panel Training: Towards a New Approach

Anaheim, California (2009) [Invited Pre-IFT short course]

2010-2012

Sensory Product and Concept Testing: Analyses, Applications and Computer Workshop

Williamsburg, Virginia (2010, 2011)

Drivers of Liking[®], Segmentation and Portfolio Optimization

White Sulphur Springs, West Virginia (2010, 2011)

Sensory Testing for Product Development and Claims Support

New Orleans, Louisiana (2011) [Invited Pre-IFT short course]

Advertising Claims Support: Case Histories and Principles

Sea Island, Georgia (2012)

INSTITUTIONS REPRESENTED AT DR. ENNIS' SHORT COURSES & WORKSHOPS

A. C. Humko	Duckworth's	Matfors	(SAM) Sensory and
Abbott Labs - Ross Div.	E. & J. Gallo Winery	McCormick & Co. Inc.	Marketing
Adacta Mkt & Ricerche	Earthgrains Company	McDonald's Corp.	Schick/Wilkerson
Ahold USA	Elite Industries Ltd.	McKee Foods Corp.	Seagrams
American Maize	Elma Chips	McNeil Speciality Foods	Senomyx, Inc.
Product Co.	Estee Lauder Cos.	Mead Johnson Nutritionals	SenseTest
AmSid International	EWHA Womans	Miller Brewing Co.	Sensient Flavors Inc.
Amway Corp.	University	Minute Maid	Sensory Dimensions
Arbor Inc.	Fachhochschule	Mississippi State University	Sensory Solutions
Arrowhead Mills, Inc.	Neubrandenburg	Monsanto, Inc.	Shell
Aurora Foods	Firmenich Inc.	Morningstar (Dean Foods)	Shuster Labs., Inc.
Avon Products, Inc.	Fiskeriforskning	Nabisco, Inc.	Starbucks Coffee Co.
Bath & Body Works	FMC Foodtech	National Advertising	Stoner Inc.
Beiersdorf AG	Food Perspectives	Division (NAD)	Sunchon National University
Best Foods	Friesland Coberco Dairy	NC State University	Taco Bell Corporation
Biotechnological	Foods	Nestec	Takasago International
Institute, Denmark	Frito-Lay, Inc.	Nestle	The Dannon Co. Inc.
Block Drug Co.	Geo-Centers	Nova Southeastern Univ.	The Dial Corp.
Blockbuster	Georgia Pacific Corporation	Ocean Spray	The Gillette Company
Entertainment	Gerber Product Co.	Cranberries, Inc.	The Iams Co.
Blyth, Inc.	Givaudan Flavors	Ohio State University	The Institute for Sensory
Borden Foods Corp.	H. E. Butt Grocery Co.	Oregon State University	Research
British American	Haarman & Reimer	Oscar Mayer Foods Corp.	The Mennen Co.
Tobacco	Heineken	Palatex, Inc.	The NutraSweet Co.
Brooks Food Group	Helene Curtis Inds. Inc.	Papa John's Int'l, Inc.	The Pillsbury Company
Brown Forman	Hershey Foods Corp.	Pedigree Master Foods	The Stroh Brewery Co.
Beverages	Hills Pet Nutrition, Inc.	Pepsi-Cola Company	Tiax LLC
Brown and Williamson	Hoffmann-LaRoche, Inc.	Pert Survey Research	TNS/Teleseker MTR
Bunge Foods Corp.	Hunt-Wesson	Peryam & Kroll	Tree Top, Inc.
Bush Brothers & Co.	Int'l Flavors & Fragrances	Pfeizer Inc.	Tropicana Products, Inc.
Cadbury/Schweppes	Interbrew	Philip Morris	Twentieth Century Mutual
Campbell Soup Co.	Instituto Technologica de	Companies Inc.	Funds
Campden & Corleywood	Varacarus, Mexico	Planters Lifesavers	Tyson Foods, Inc.
Chase Manhattan Bank	J. Reckner Associates	Procter & Gamble Co.	U.S.D.A. at NC State
Chew Tech	Jim Beam Brands Co.	Prod. Dynamics Inc.	Uncle Ben's Australia
Church & Dwight Co. Inc.	Johnson & Johnson	Product Perceptions Ltd.	Unilever
Clorox Co.	Kal Kan Foods, Inc.	Proskauer Rose LLP	United Biscuits, UK
Coca-Cola Company	Kalsec, Inc.	PSA Peugeot Citroen	Universal Flavors
Colgate Palmolive Co.	Kansas State University	Qi Statistics	University of California
Colmar Brunton	Kellogg Co.	Quaker Oats Co.	University of Illinois Urbana
Combe Inc.	Kerry Ingredients	Quest International	Champaign
ConAgra Foods	Kimberly Clark Corp.	R.J. Reynolds Tobacco	University of Maine
Coors Brewing Co.	Kraft Foods, Inc.	Reebok Int'l, Ltd.	University of Minnesota
Cornell University	Kronenbourg	Rexall Sundown	University of Missouri
CPC International	Labatt Breweries	Rich-SeaPak Corp.	University of Pretoria
Cryovac	Land O'Lakes, Inc.	RJR Nabisco Inc.	V&S Vin & Sprit AB
Danone Vitapole	L'Oreal Recherche	Ross Labs	Vinquiry Inc.
David Michael & Co.	M & M Mars Inc.	Rothman, Benson &	Wageningen Centre for
Degussa Flavors	Malacoleaf	Hedges	Food Sciences
Delmonte Fresh Produce	Malt-O-Meal	Royal Vet. and Agri.	Wells Dairy Inc.
DESA-ISETA	Marc Inc.	Institute, Denmark	Wendy's Int'l Inc.
Diageo	Market Facts Inc.	S.C. Johnson & Son Inc.	Wild Flavors, Inc.
Dominos Pizza LLC	Marketing Research Svcs	Sadia S.A.	Winona Research
Dragoco, Inc.	Massalin Particulares S.A	Sara Lee	Wm. Wrigley Jr. Co.
DSM Food Specialties	Masterfoods		